Friday Night Fun with Flags:
GeoGebra for Geometry & Graphing

STEP by STEP Instructions

Presented By:

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Who is IMSA? The **Illinois Mathematics and Science Academy**, or **IMSA**, is a three-year residential public secondary education institution in Aurora, Illinois, with an enrollment of approximately 650 students. Enrollment is generally offered to incoming sophomores, although younger students who have had the equivalent of one year of Algebra and a 9th grade science equivalent are eligible to apply. All applicants undergo a competitive admissions process. Due to its nature as a public institution, there are no charges related to tuition, room and board; however, there is an annual student fee which may be reduced or waived based on family income. IMSA has been consistently ranked by Newsweek as one of the top ten high schools in the country for math and science, and some of its graduates have moved on to become leaders in a variety of fields. It is the top-rated public high school in Illinois on Niche.com.

Mission: To ignite and nurture creative, ethical, scientific minds that advance the human condition.

Who is the IMSA Center for Teaching and Learning? IMSA offers professional development sessions on mathematics, science, technology, and pedagogy for pre-service and in-service educators and administrators. These professional development opportunities align with IMSA's signature strategy of learning: Inquiry-Based, Problem-Centered, Competency-Driven and Integrative. Professional learning opportunities include events held at IMSA, sessions presented at conferences, and workshops delivered in schools across the state and beyond. Educator workshops can be customized to meet any school's specific needs.

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Learning objectives:

- Discover how GeoGebra can be used in Geometry, specifically with area, through the use of the flags
- Experience how GeoGebra can be used in graphing specifically with linear equations, through the use of flags

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Fun with Flags:

GeoGebra for Geometry & Graphing

- Flag Examples
- Overview of GeoGebra
- How to Insert Images into GeoGebra
- How to Find Area of an Object in GeoGebra
- How to Graph in GeoGebra
- Explore GeoGebra

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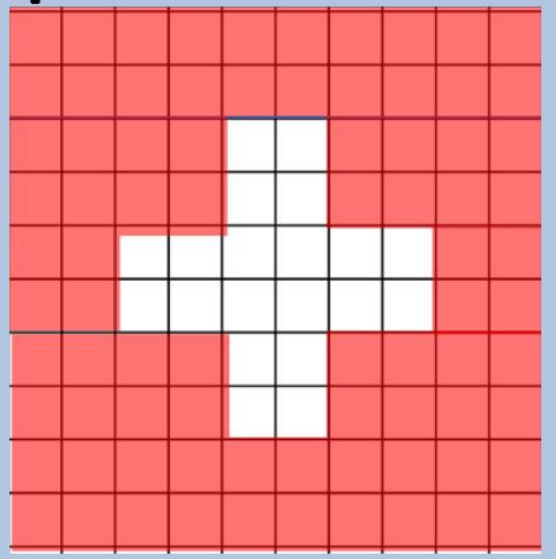
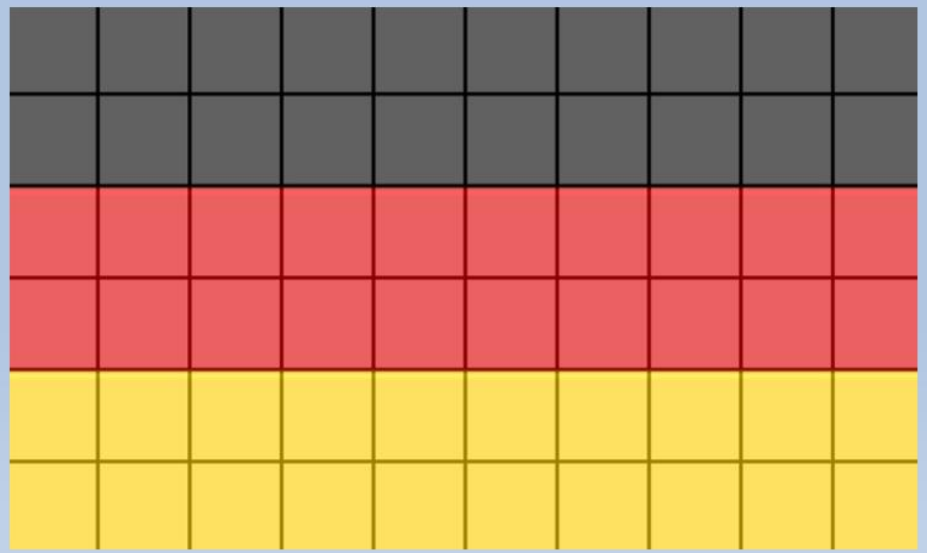
What Countries are Represented ?





Flag Source: https://www.britannica.com/

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What country has this flag?

- Since images can be of different sizes let's all use the same flag for this example found at www.britannica.com/topic/flag-of-the-Republic-of-the-Congo
- Right click & save to your desktop

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Go to

www.britannica.com/topic/flag-of-the-Republic-of-the-Congo

britannica.com/topic/flag-of-the-Republic-of-the-Congo

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Flag of the Republic of the Congo | ARTICLE | MEDIA | INFO | PRINT | CITE | FEEDBACK | SHARE

Flag of the Republic of the Congo

WRITTEN BY: Whitney Smith

See Article History

Alternative Title: flag of Congo-Brazzaville

national flag consisting of a diagonal yellow stripe separating a green triangle at the hoist from a red triangle at the fly end. It has a width-to-length ratio of 2 to 3.

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Go to

www.britannica.com/topic/flag-of-the-Republic-of-the-Congo

Right click & “Save image as…”

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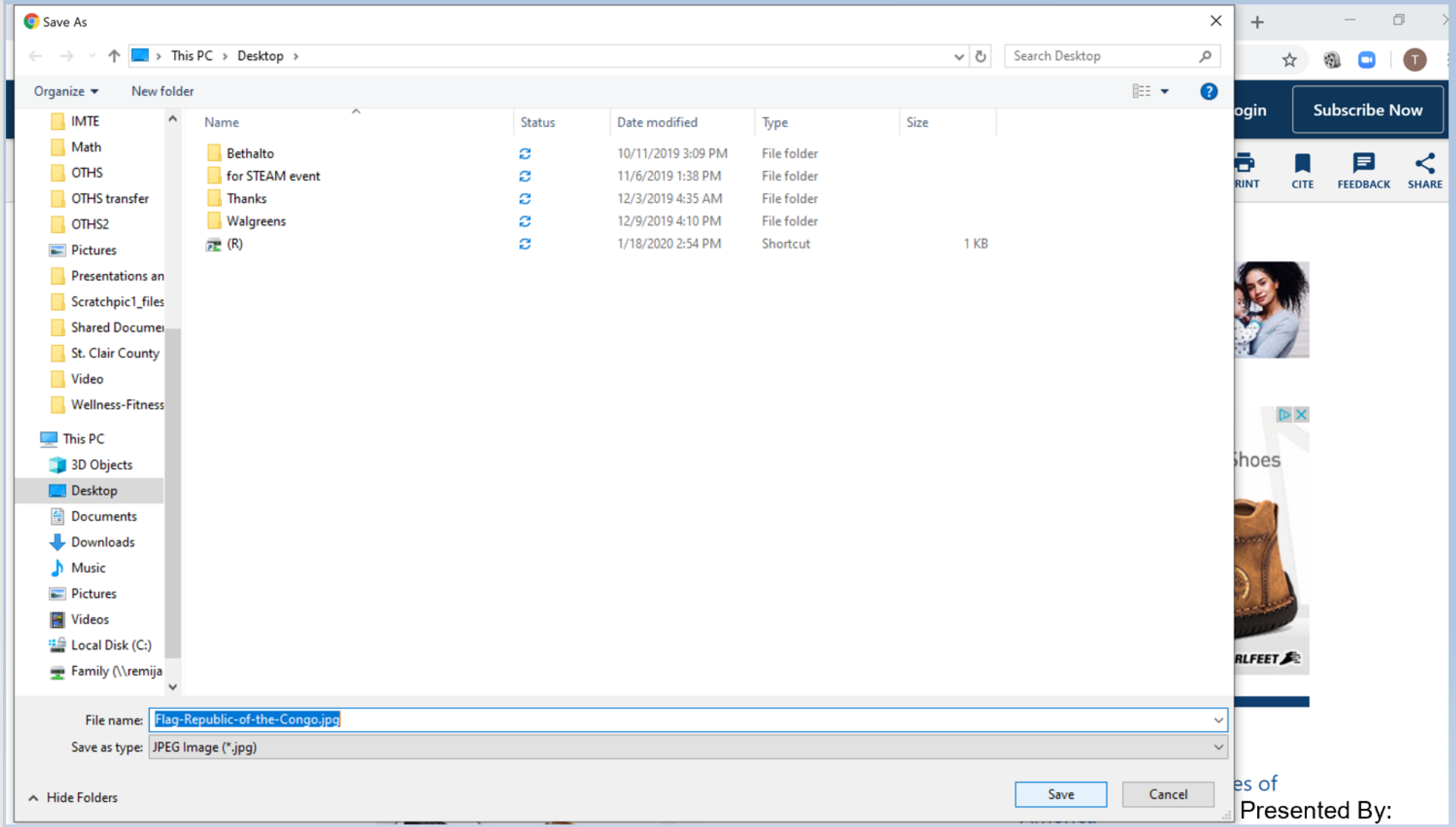
Recommendation:
Save the flag to your desktop



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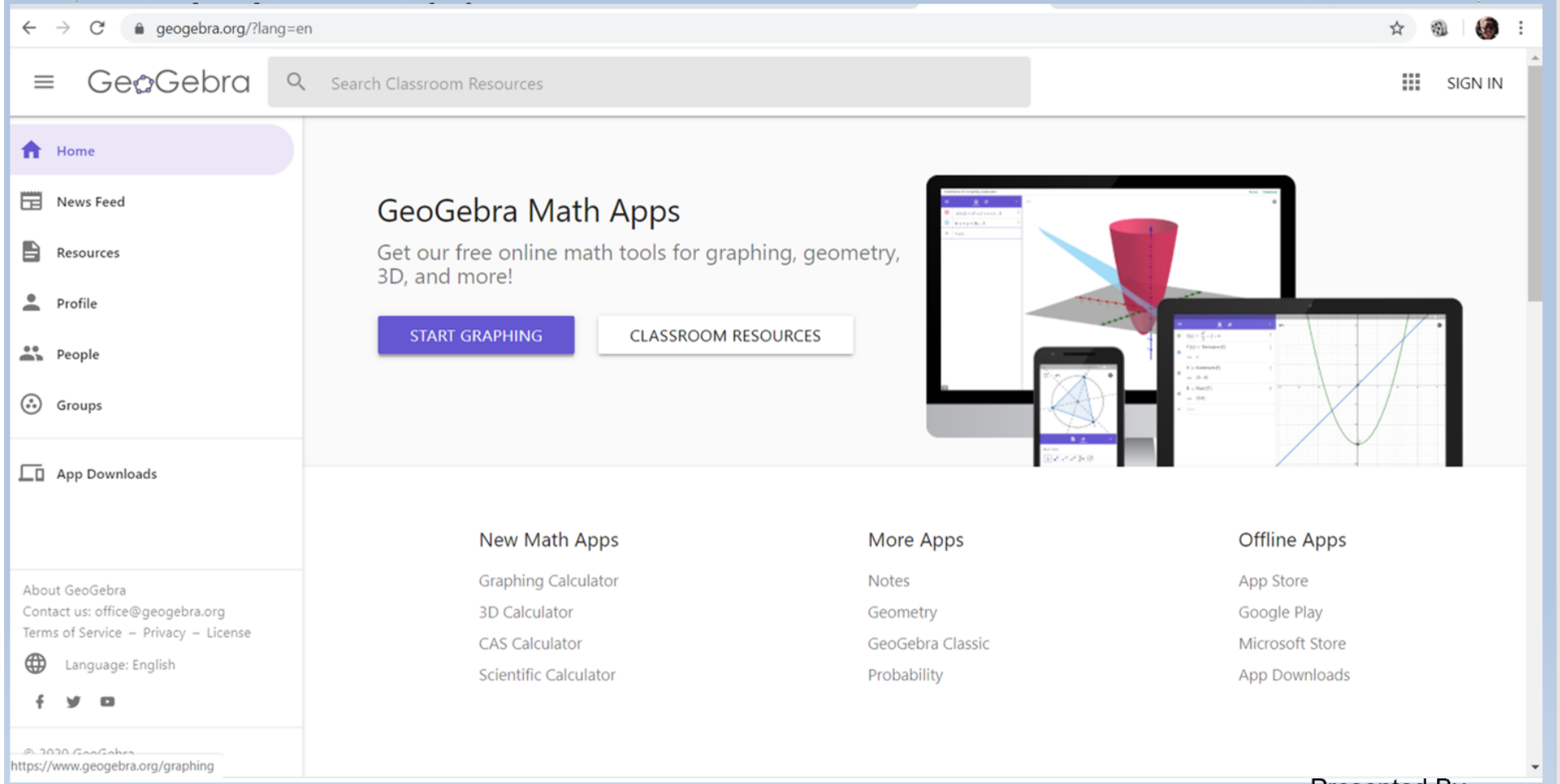
Go to GeoGebra.org

A dynamic mathematics software for all levels of education that brings together geometry, algebra, spreadsheets, graphing…



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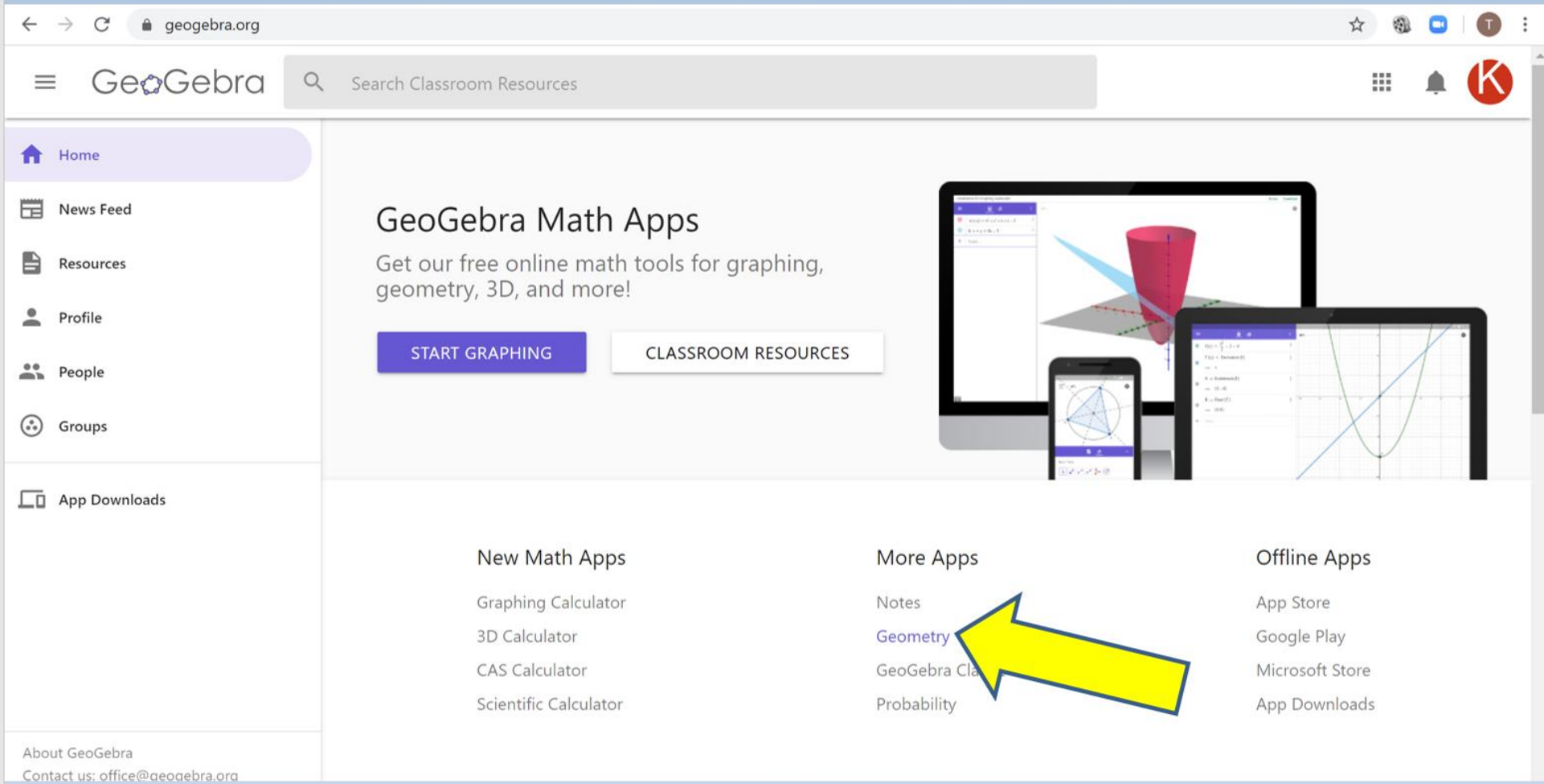
Go to www.GeoGebra.org
Click Geometry



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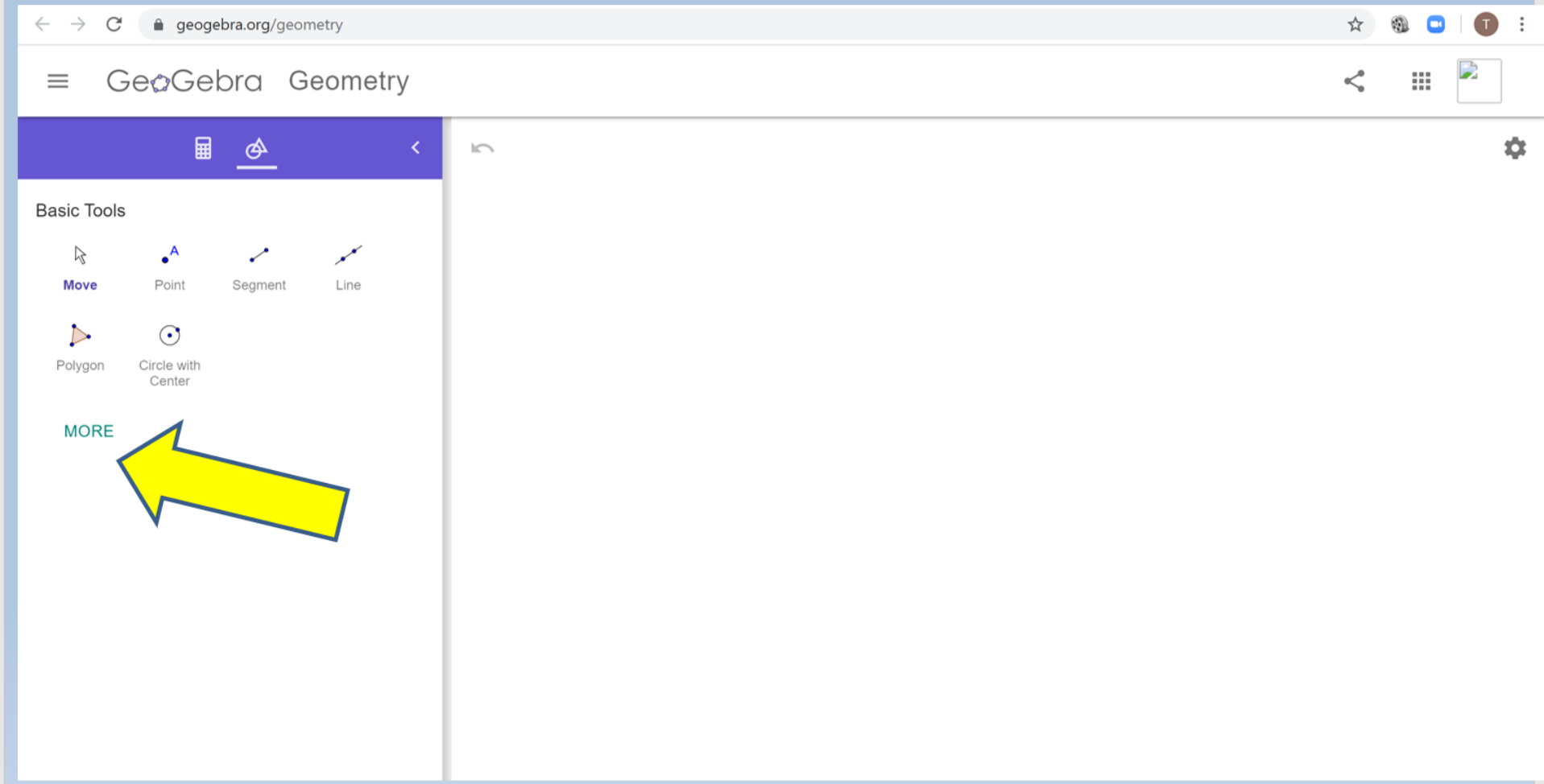
Under Geometry Basic Tools Click “More”



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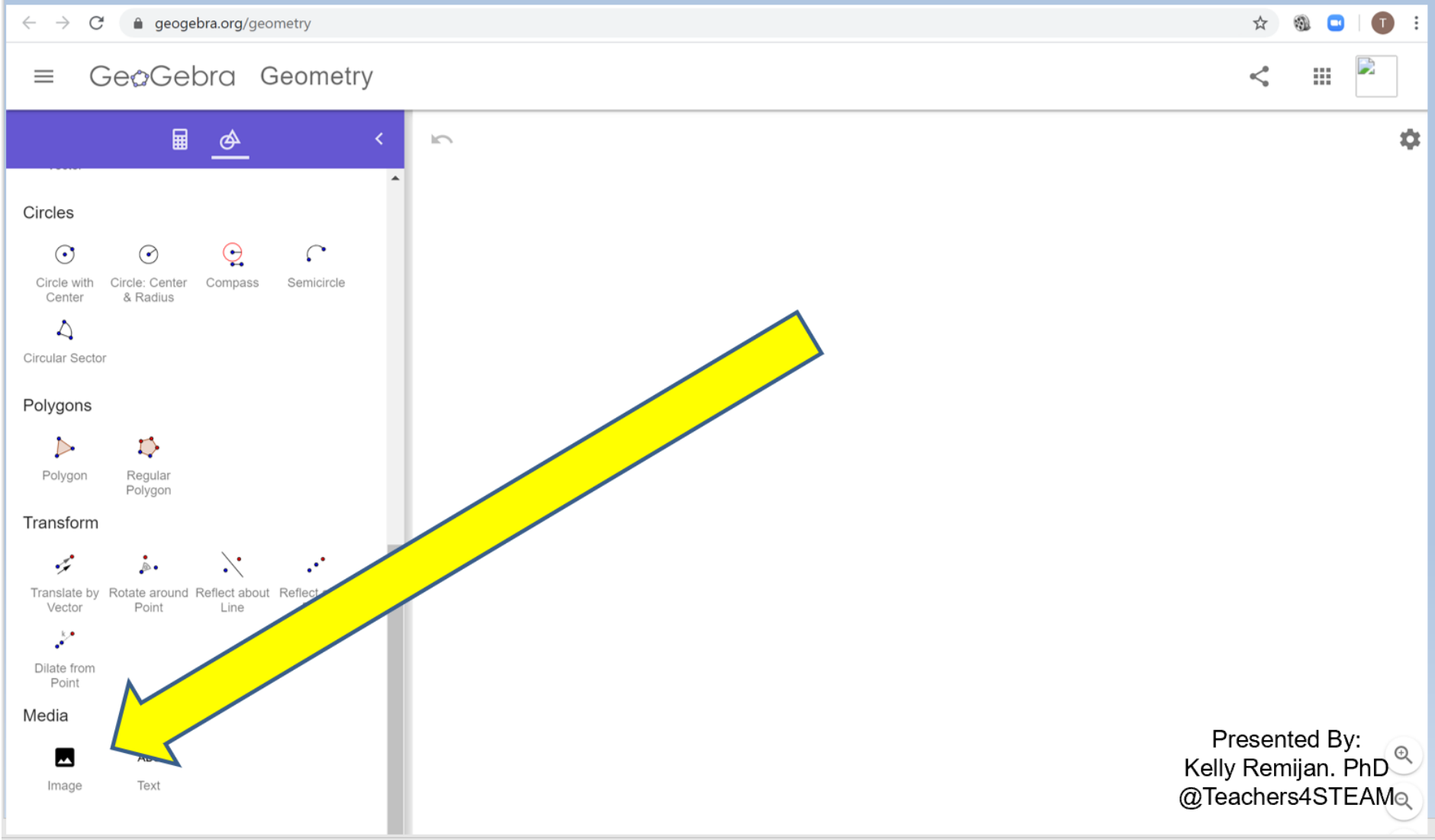
Scroll down to Media
Click “Image”



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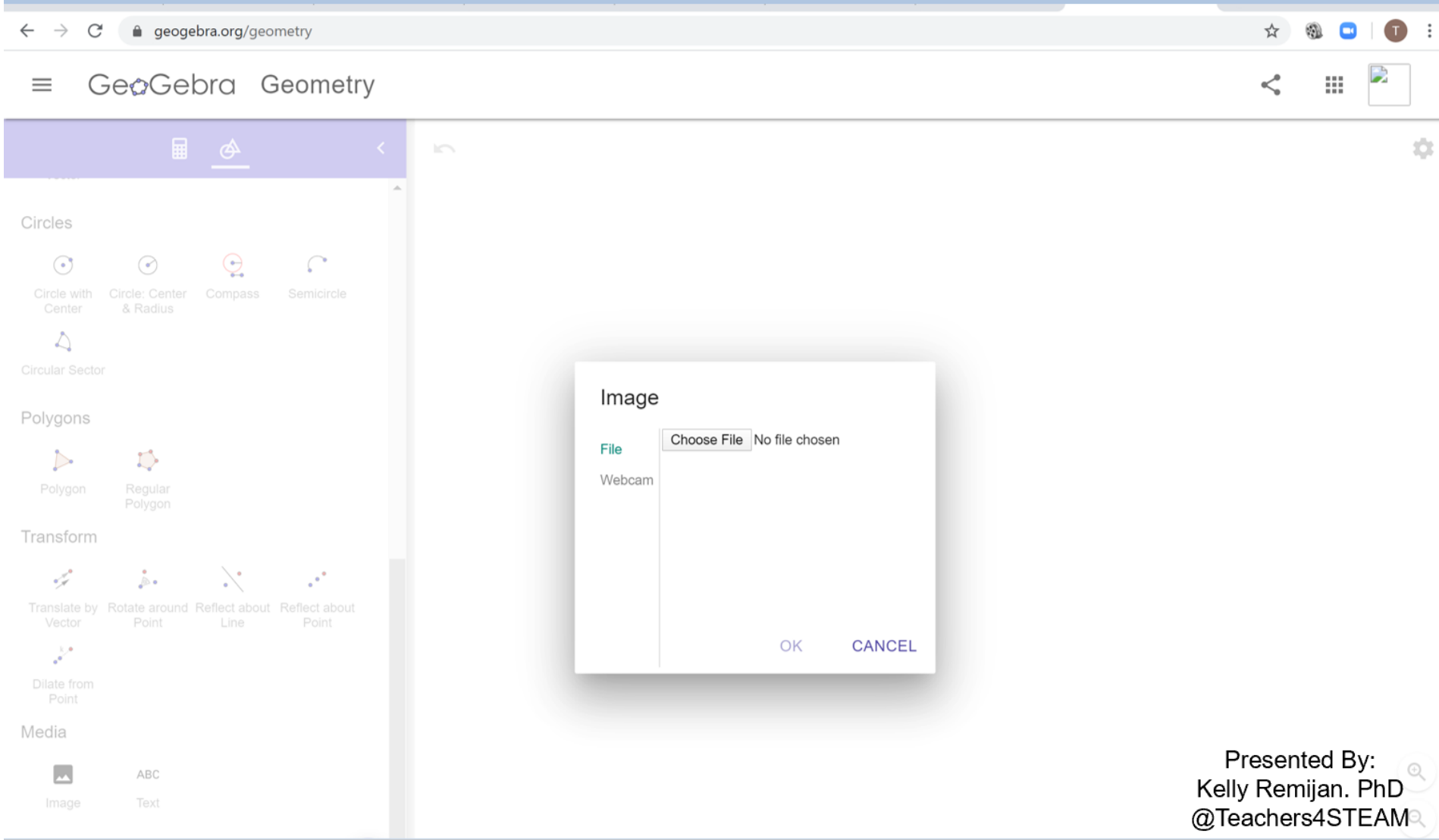
Click Choose File



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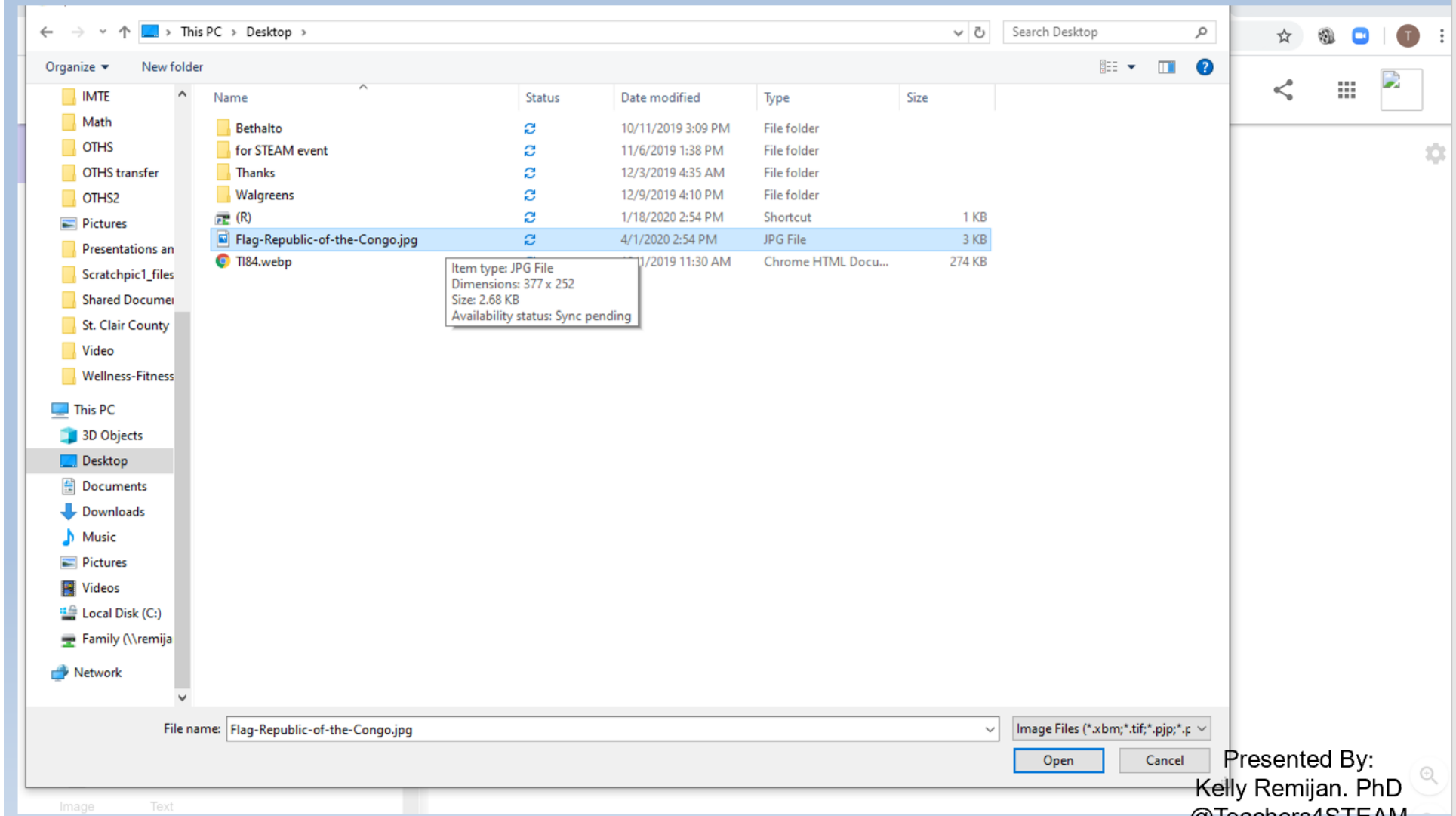
Select the flag that was saved to your desktop.



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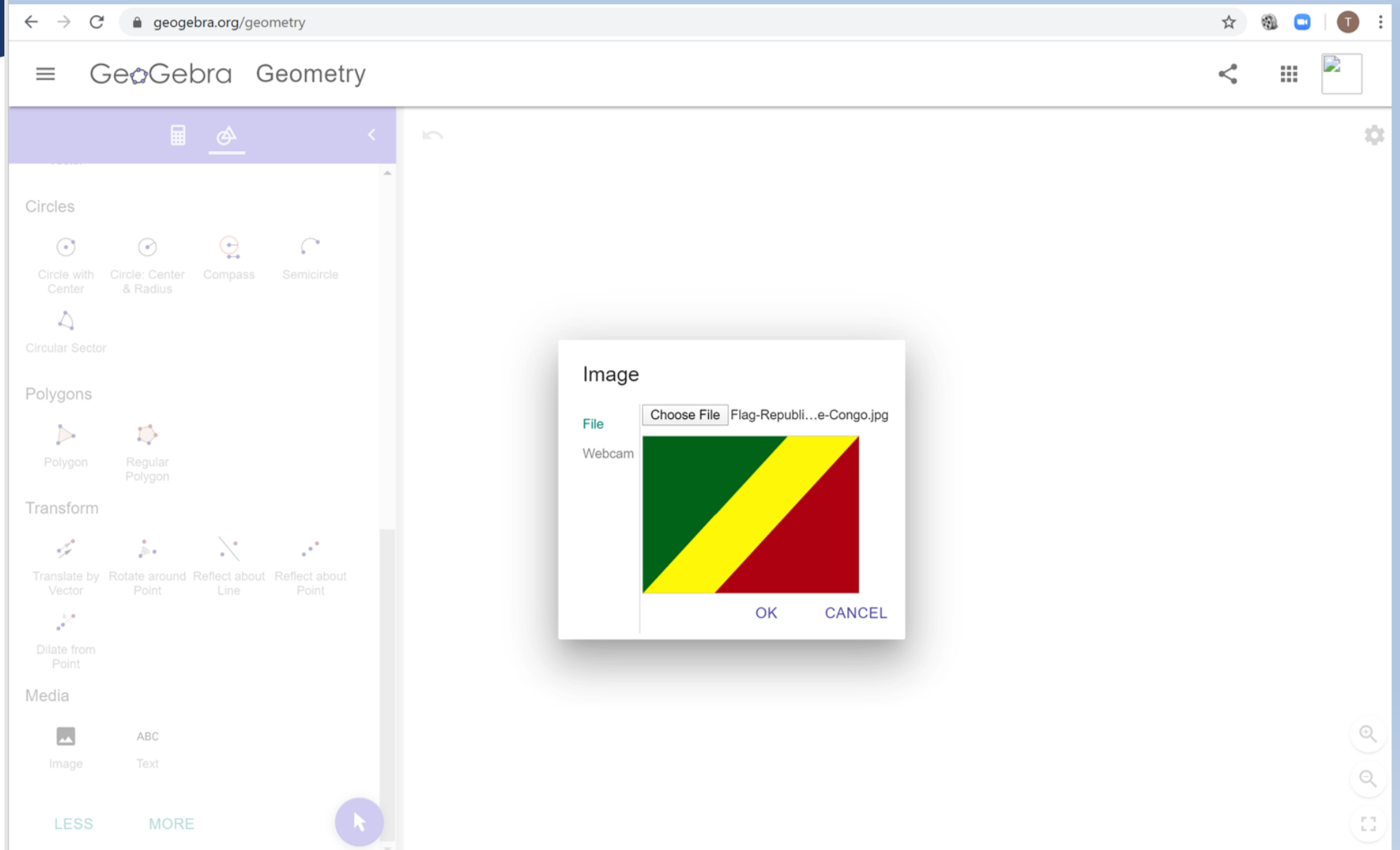
Click OK



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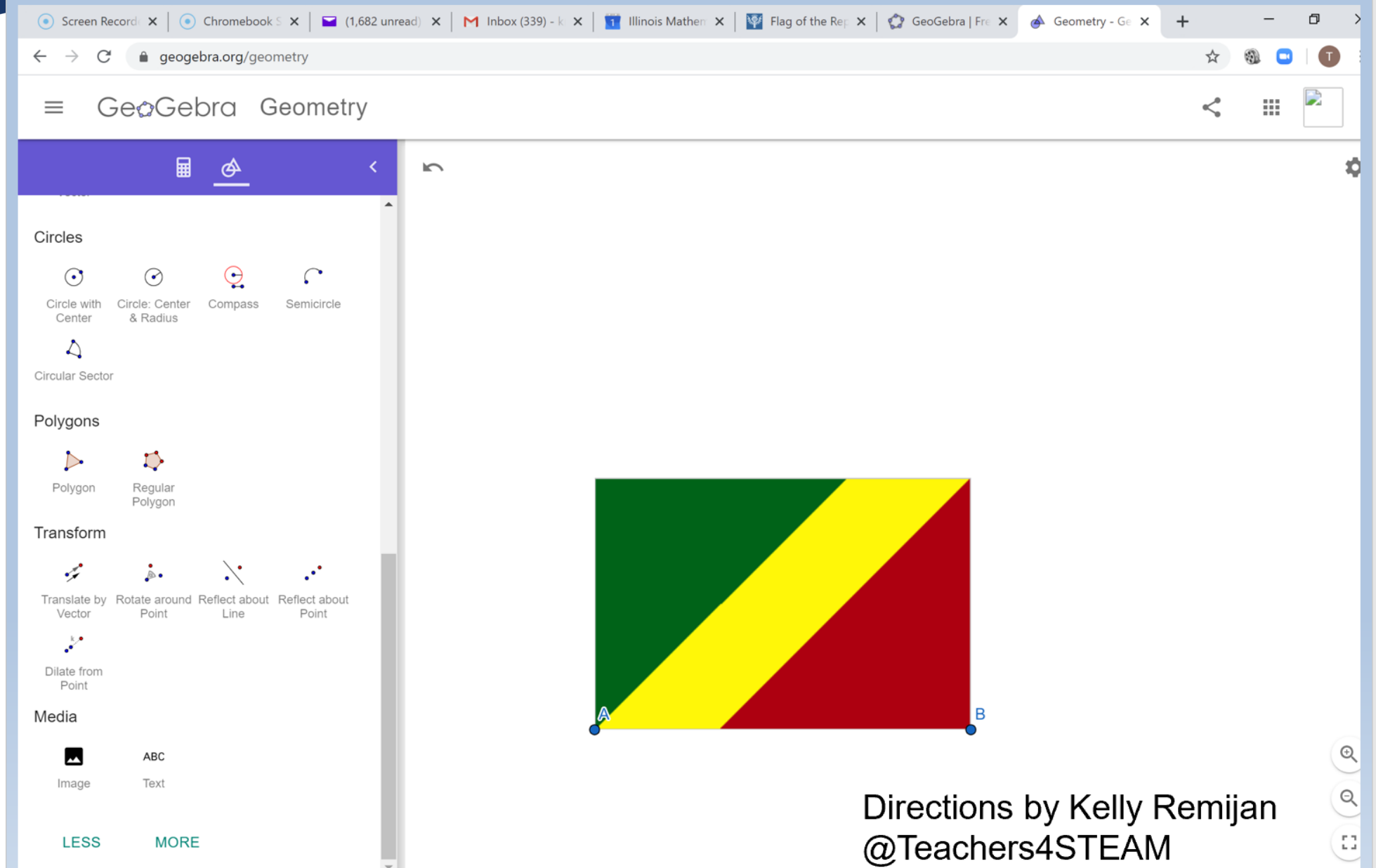
Flag Has Been Inserted into GeoGebra



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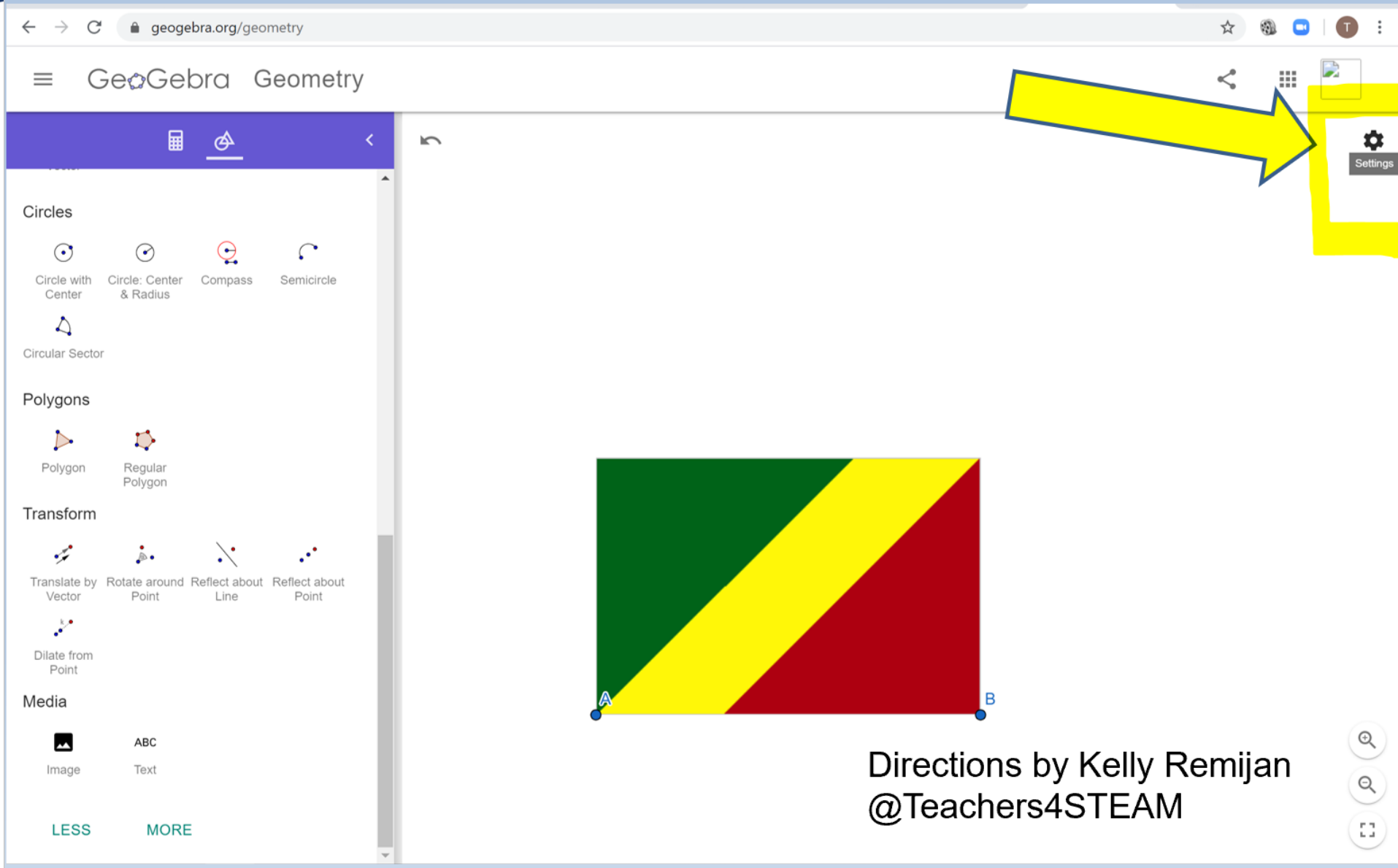
Click “Settings”



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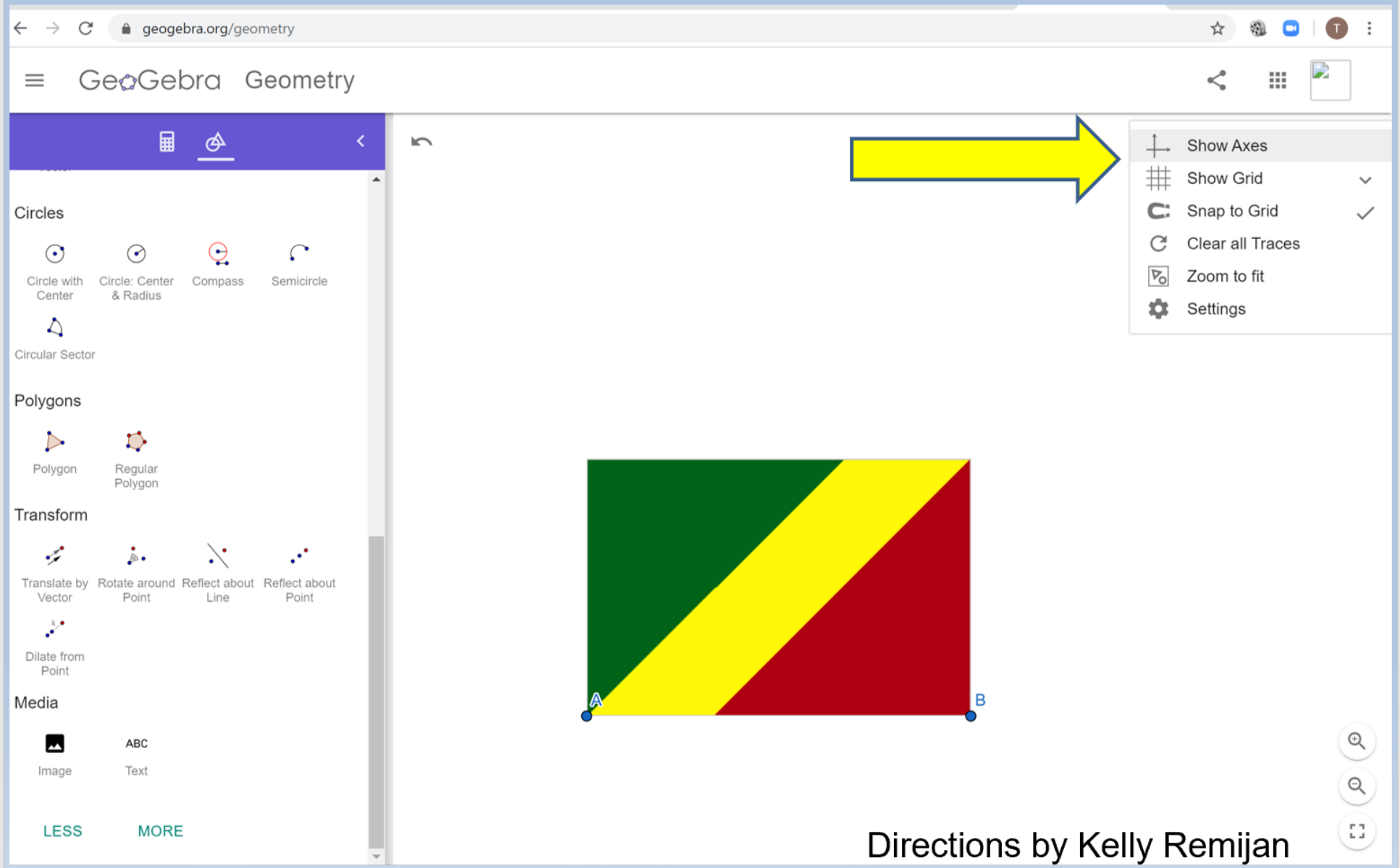
Click “Show Axes”



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Click “Show Grid”, then click “Major Gridlines”

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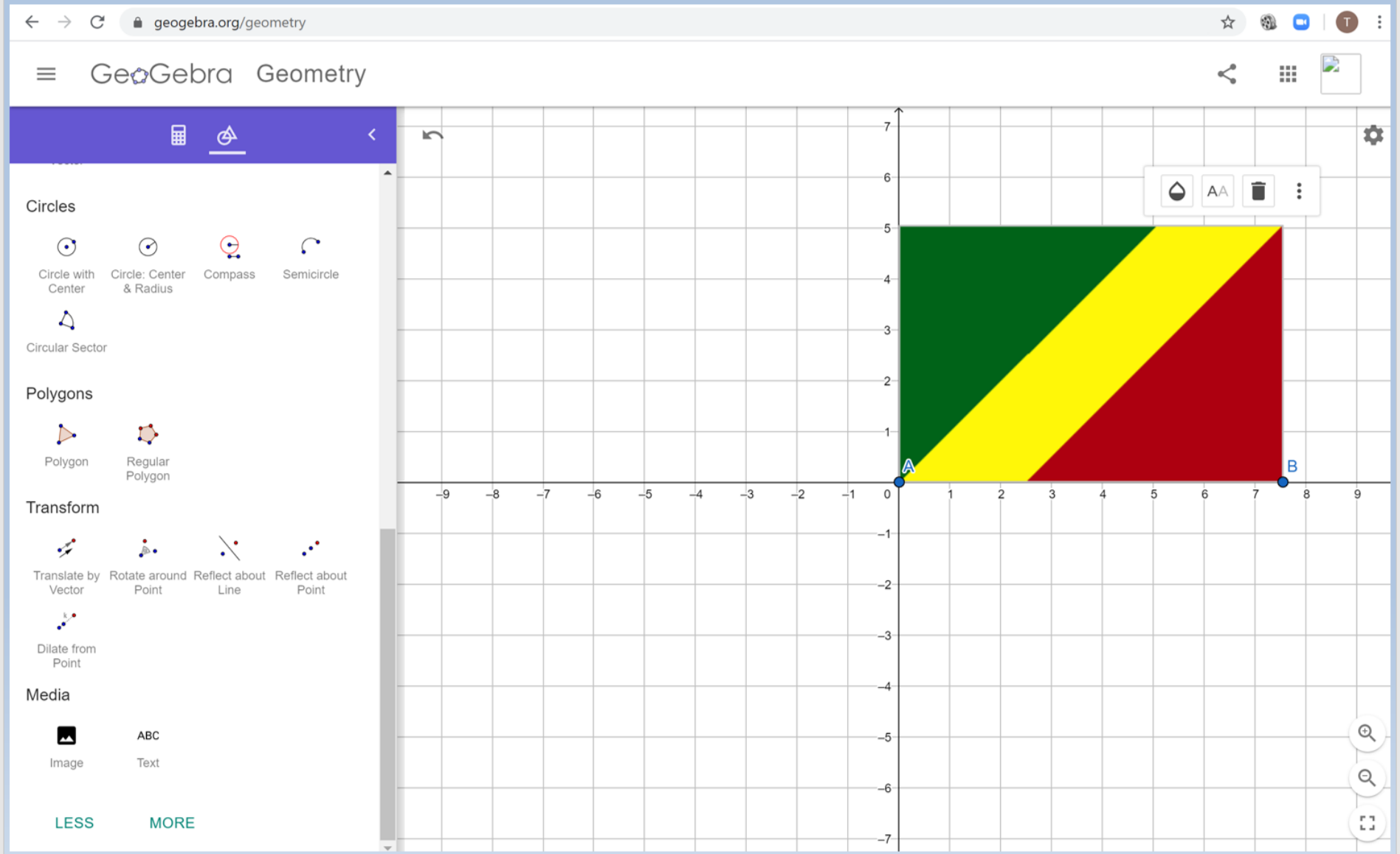
Click the flag and drag as shown



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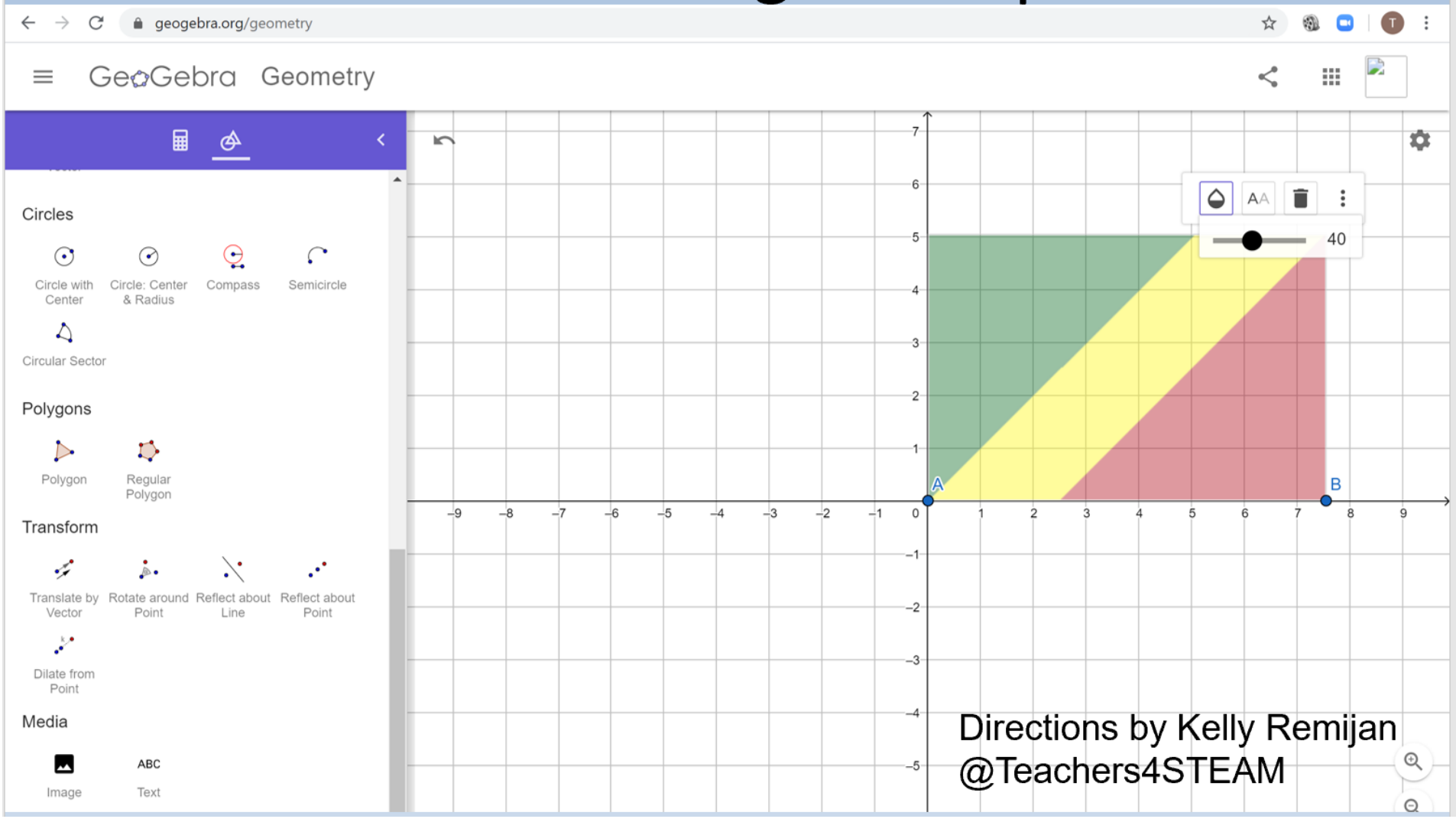
Left click on the flag, then click the “teardrop” to make the image transparent



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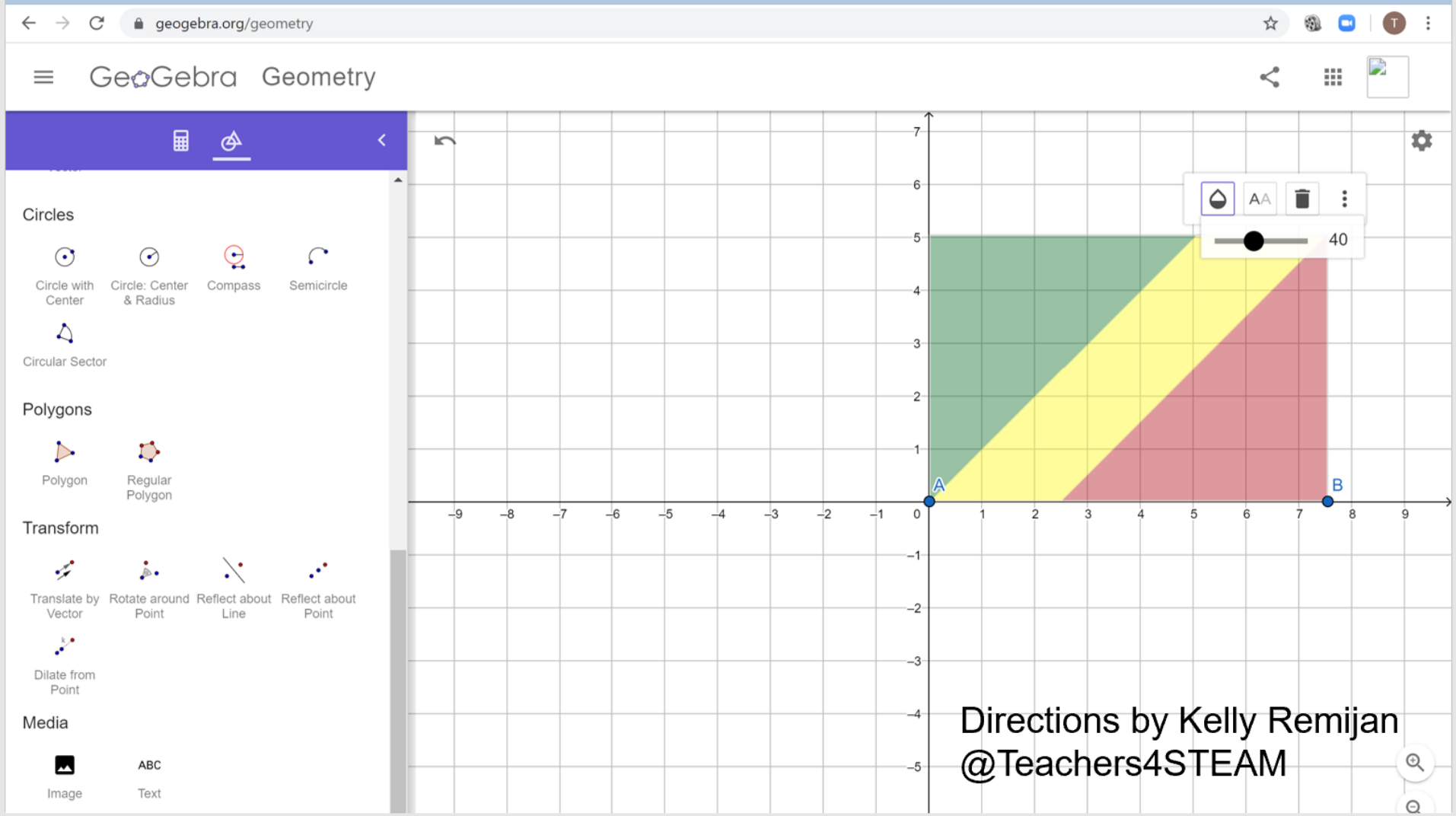
Left click on the blank graph and move the graph to see only Quadrant 1



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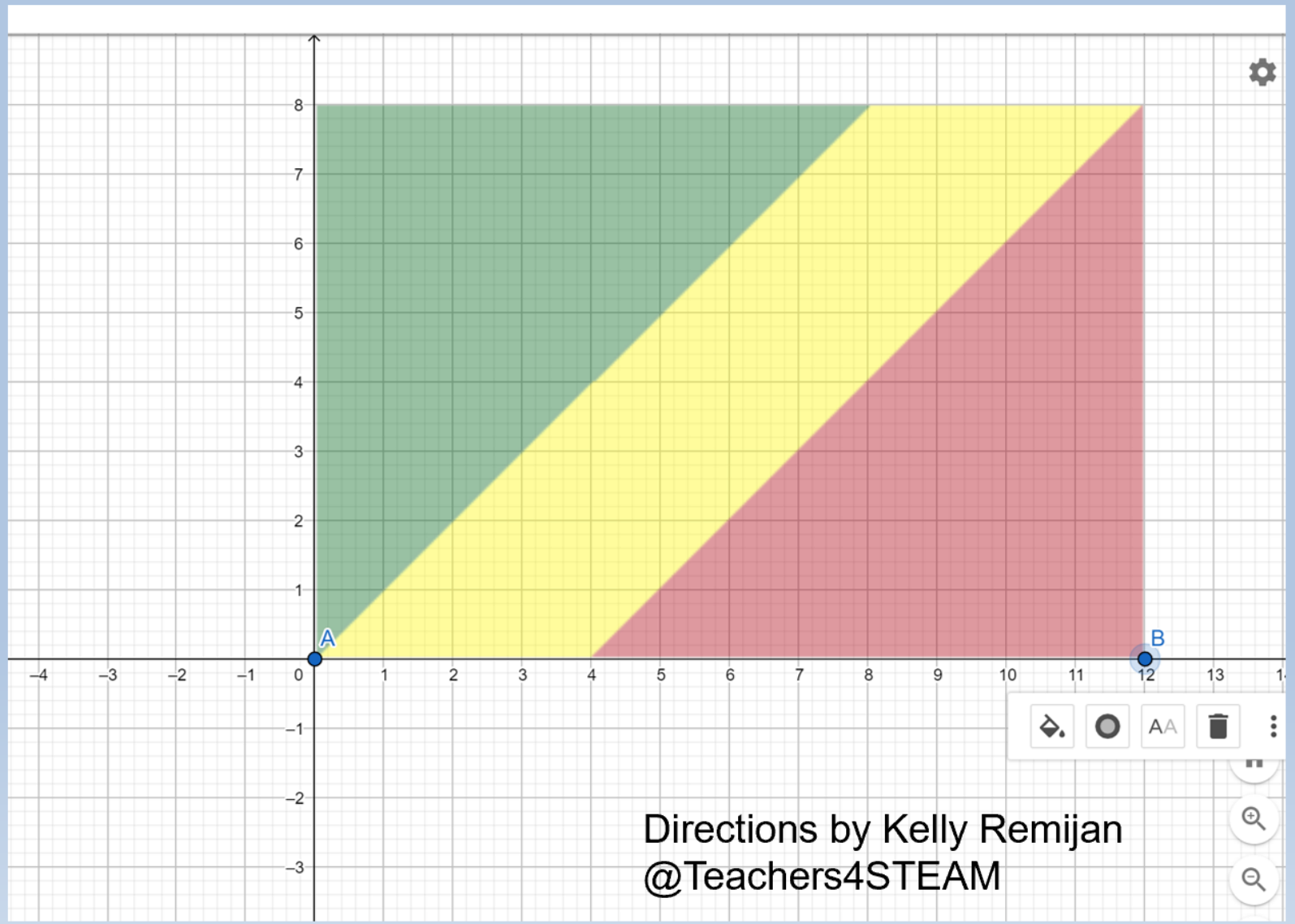
What is the Area of the Flag?



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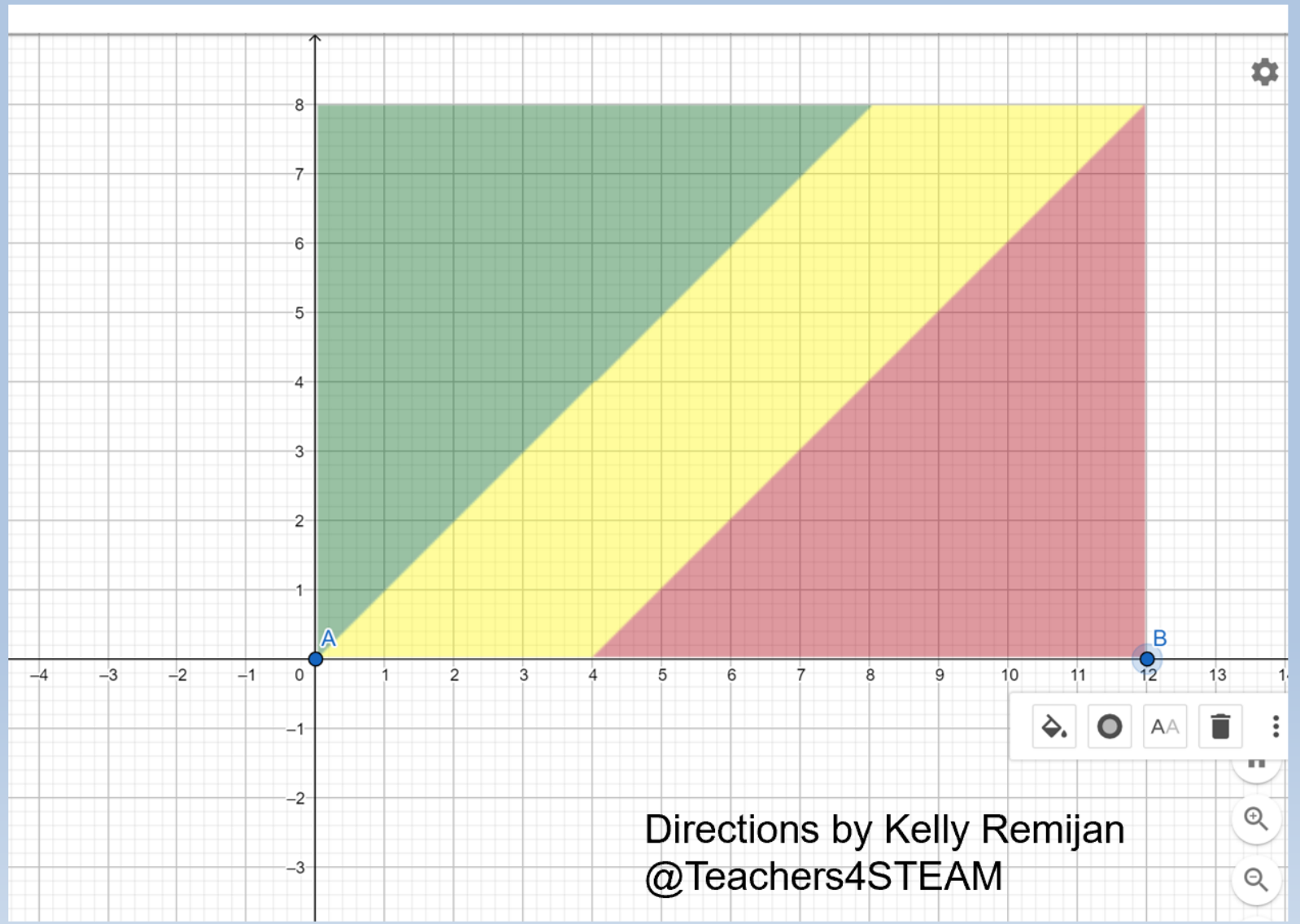
Calculate the area of the flag by hand. Then, confirm using GeoGebra.



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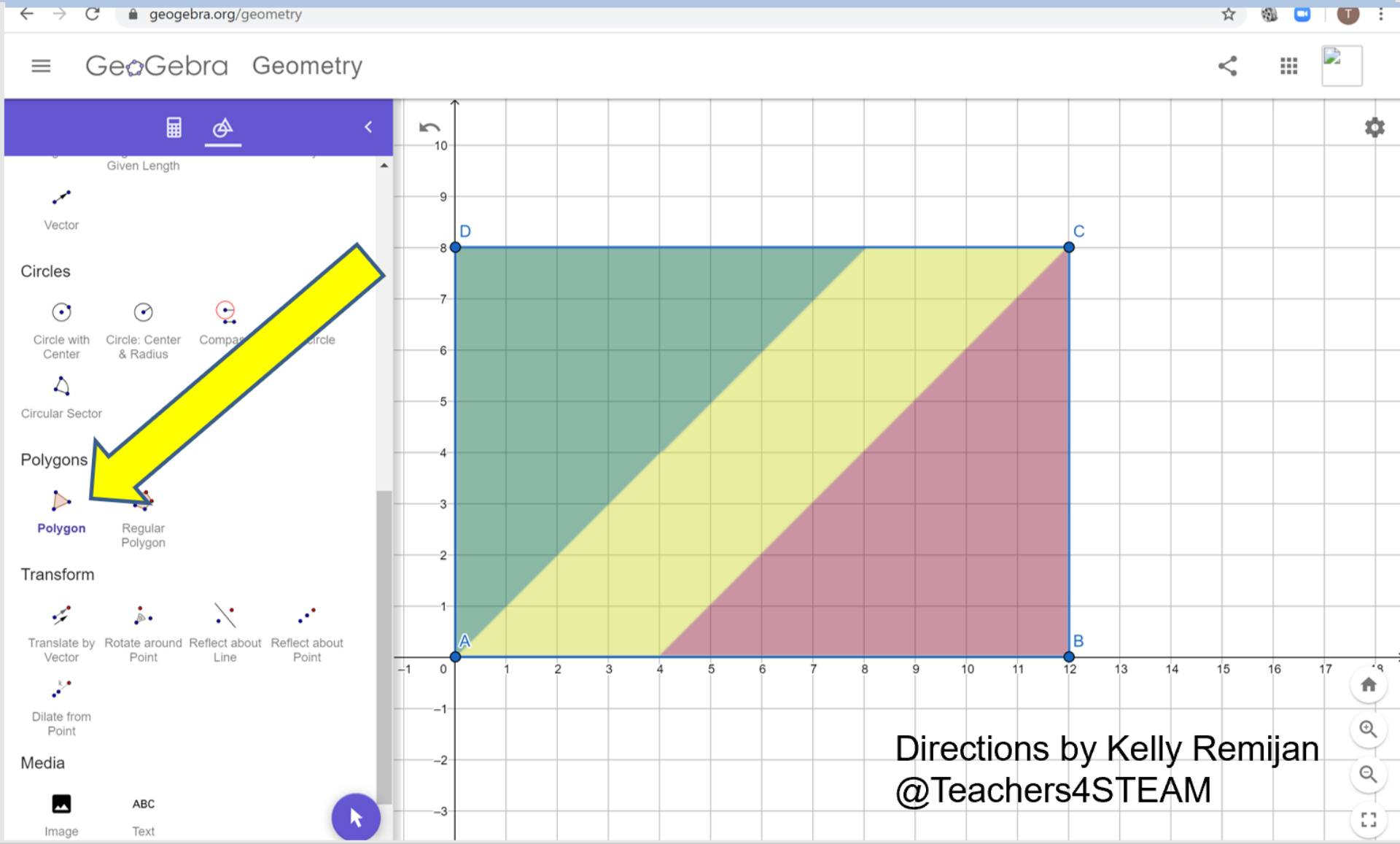
Click “Polygon”, then click the vertices surrounding the rectangle (A,B,C,D & A again)



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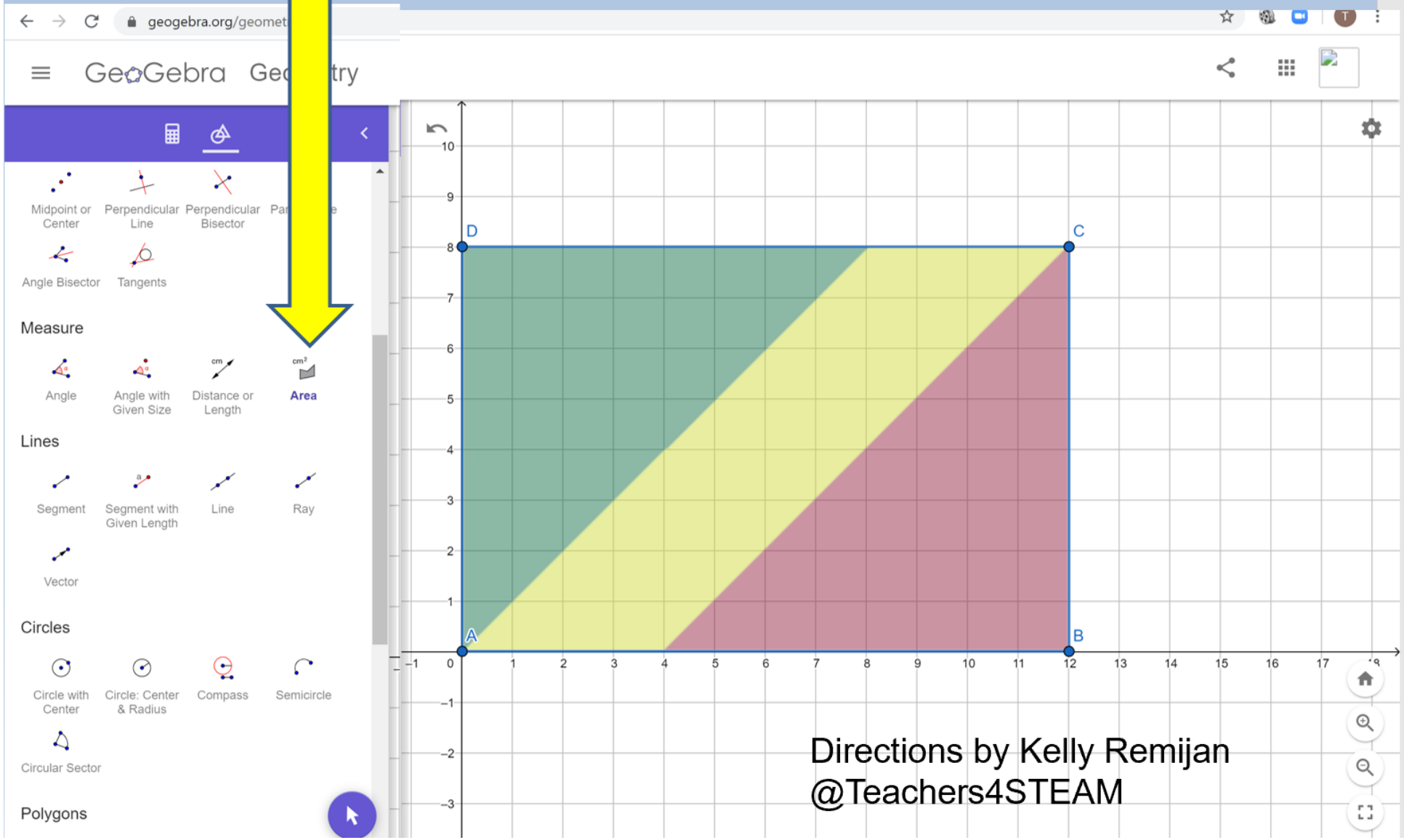
Under Measure,
Click “Area”, then Click the rectangle.



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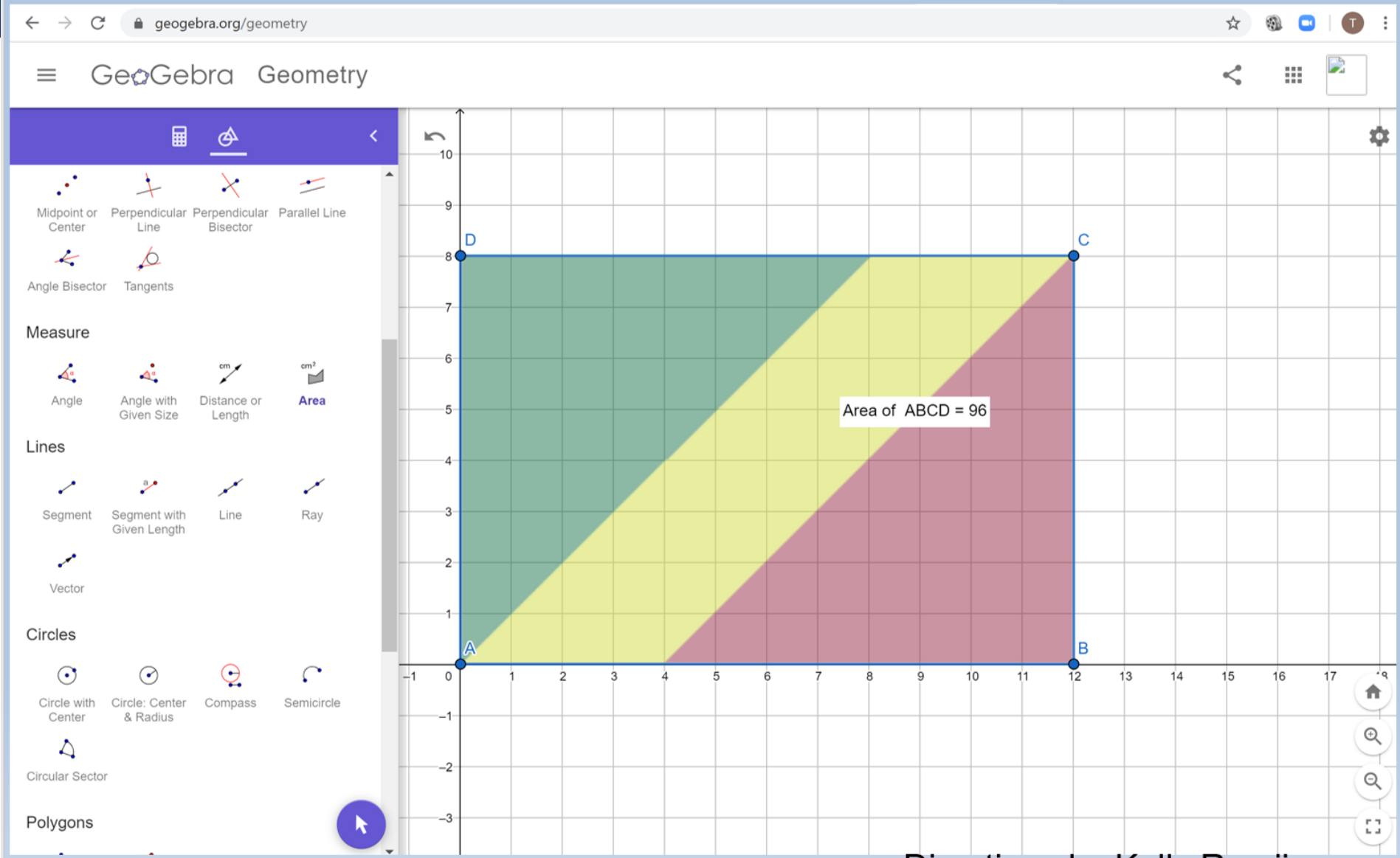
Was our area calculation correct?



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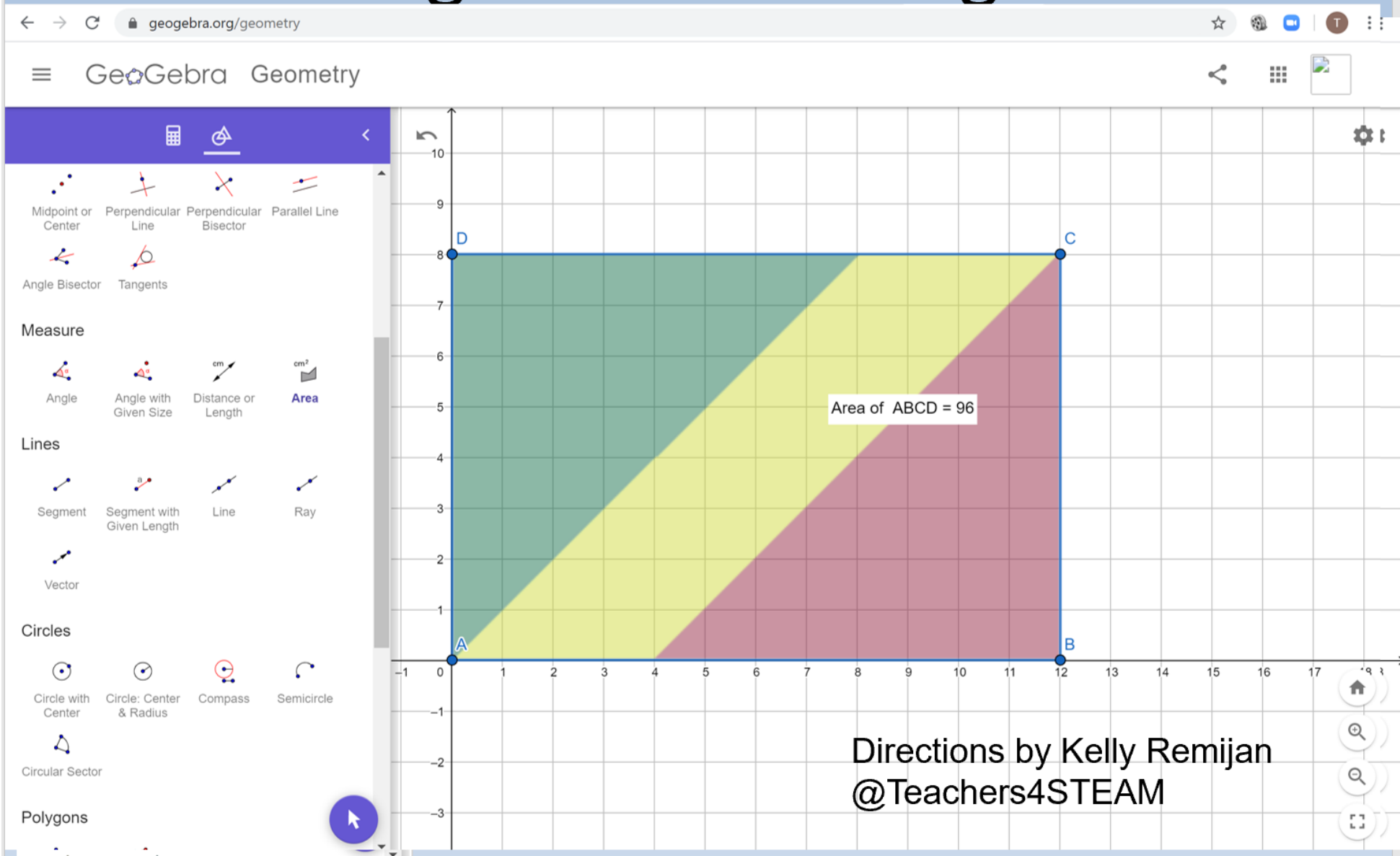
You can try other polygons within the flag or another flag…



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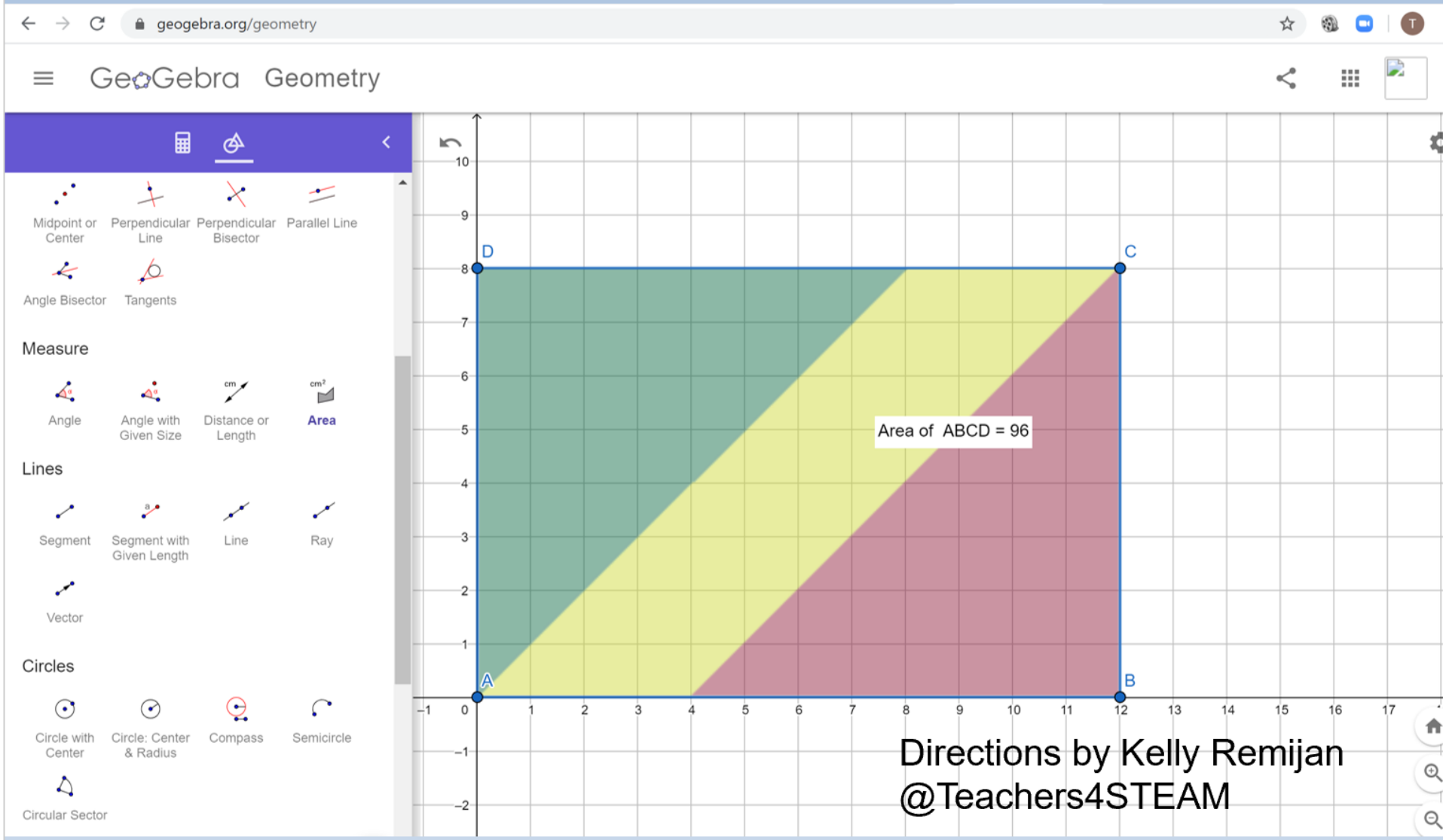
Now, lets change from working with AREA/Geometry to GRAPHING/Algebra



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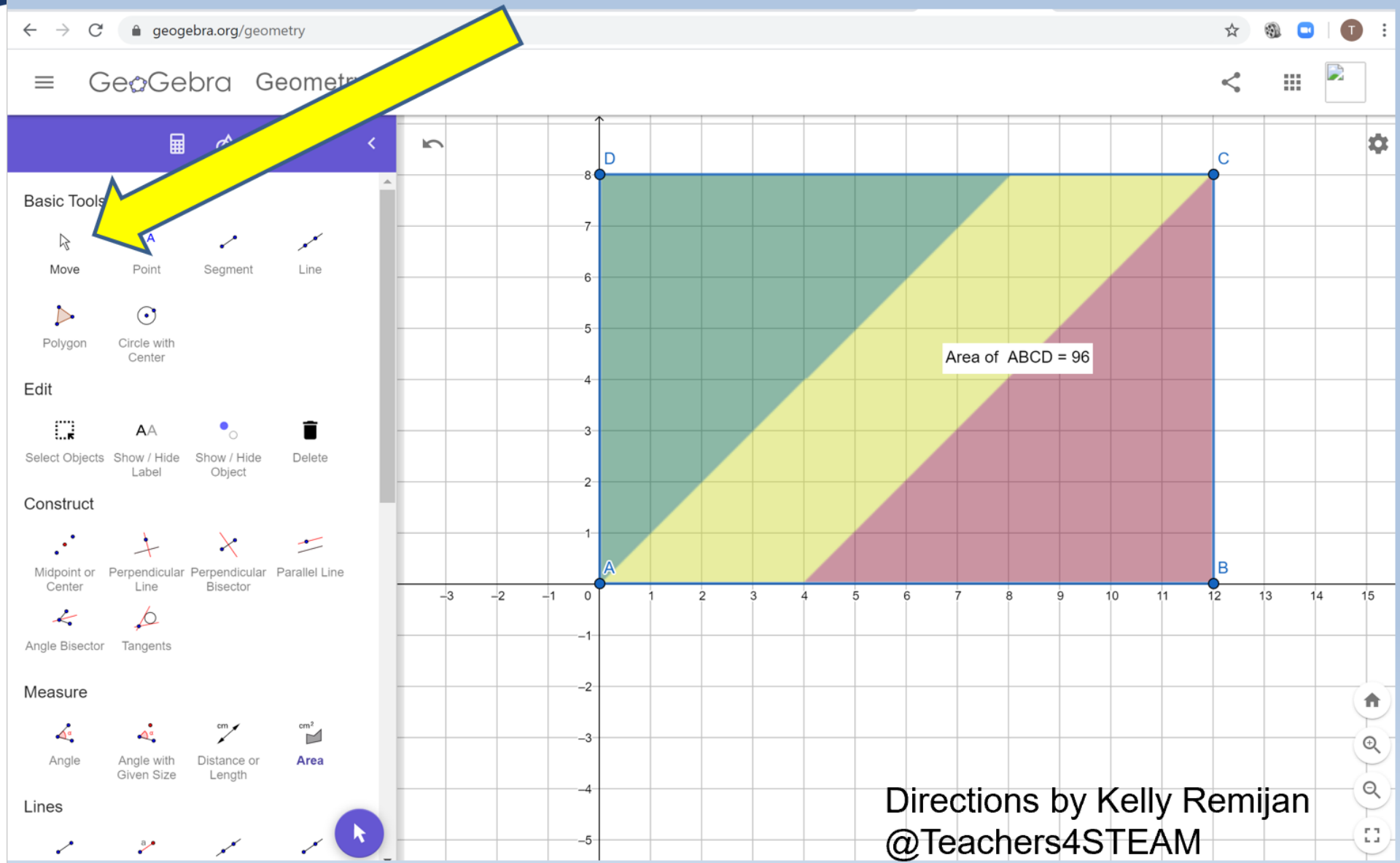
Under Basic Tools, Click “Move”



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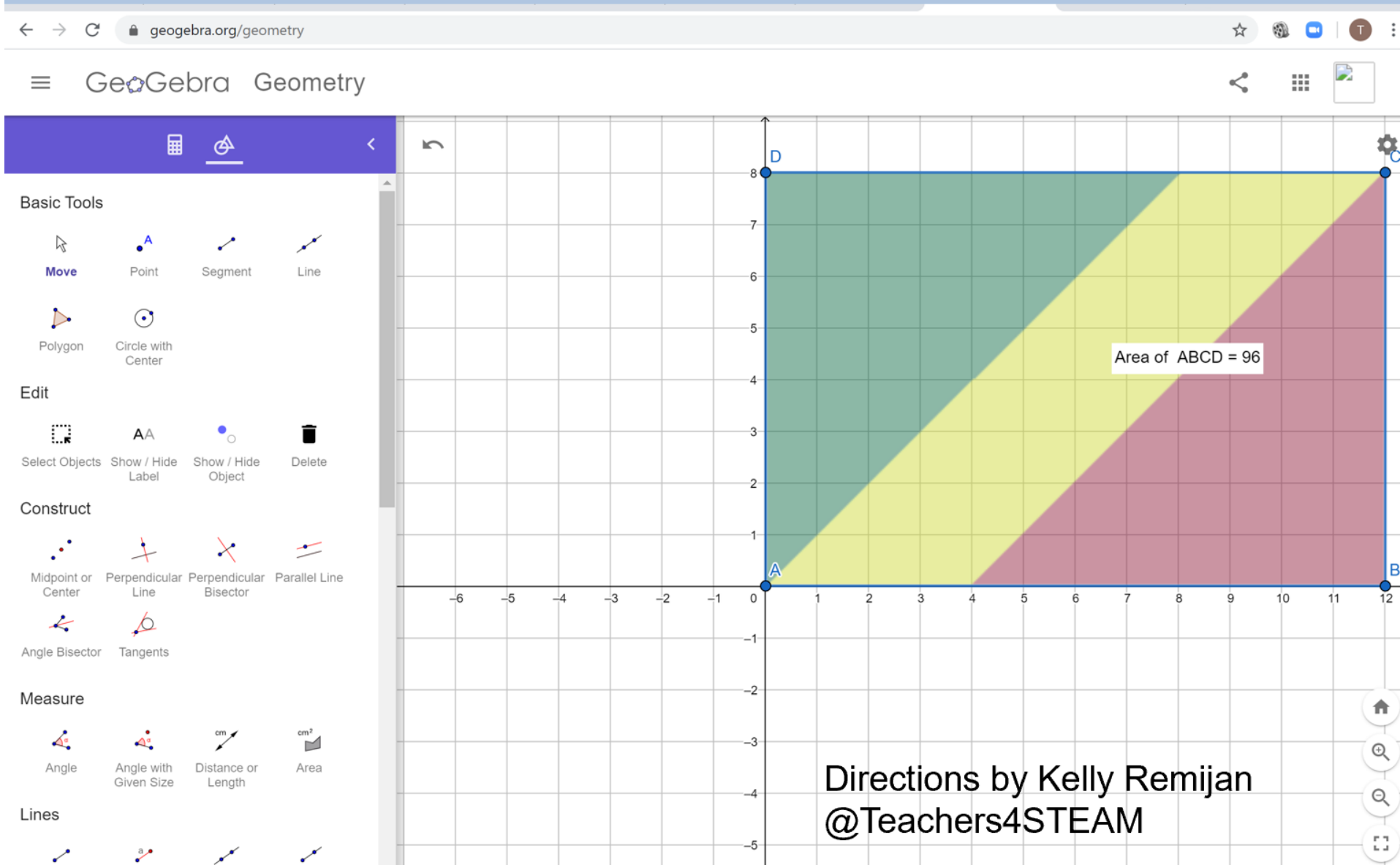
Click point D (& delete), Click point C (& delete), then click the flag



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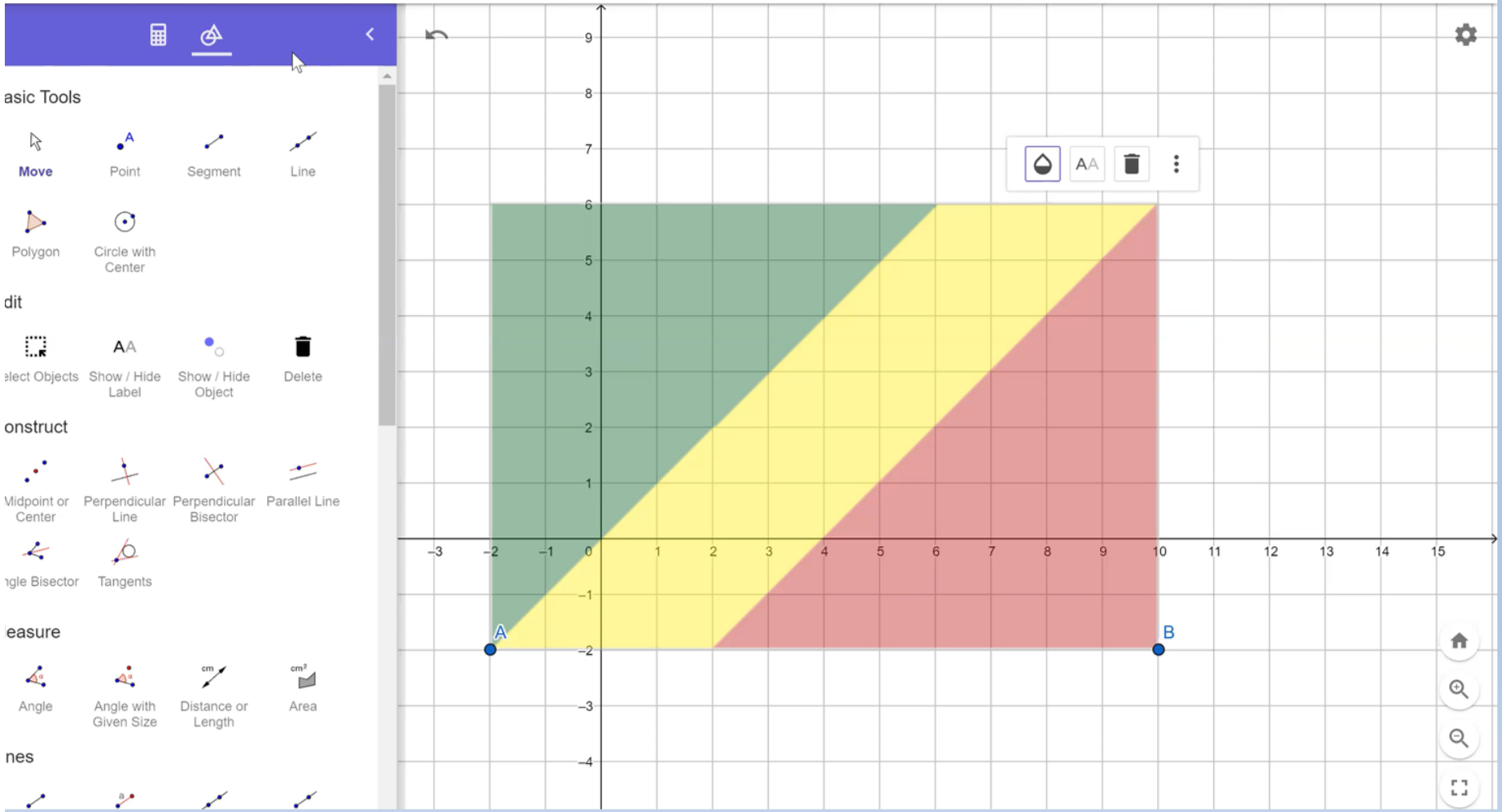
Click on the flag and drag to have a Domain of [-2,10] and a Range of [-2,6]



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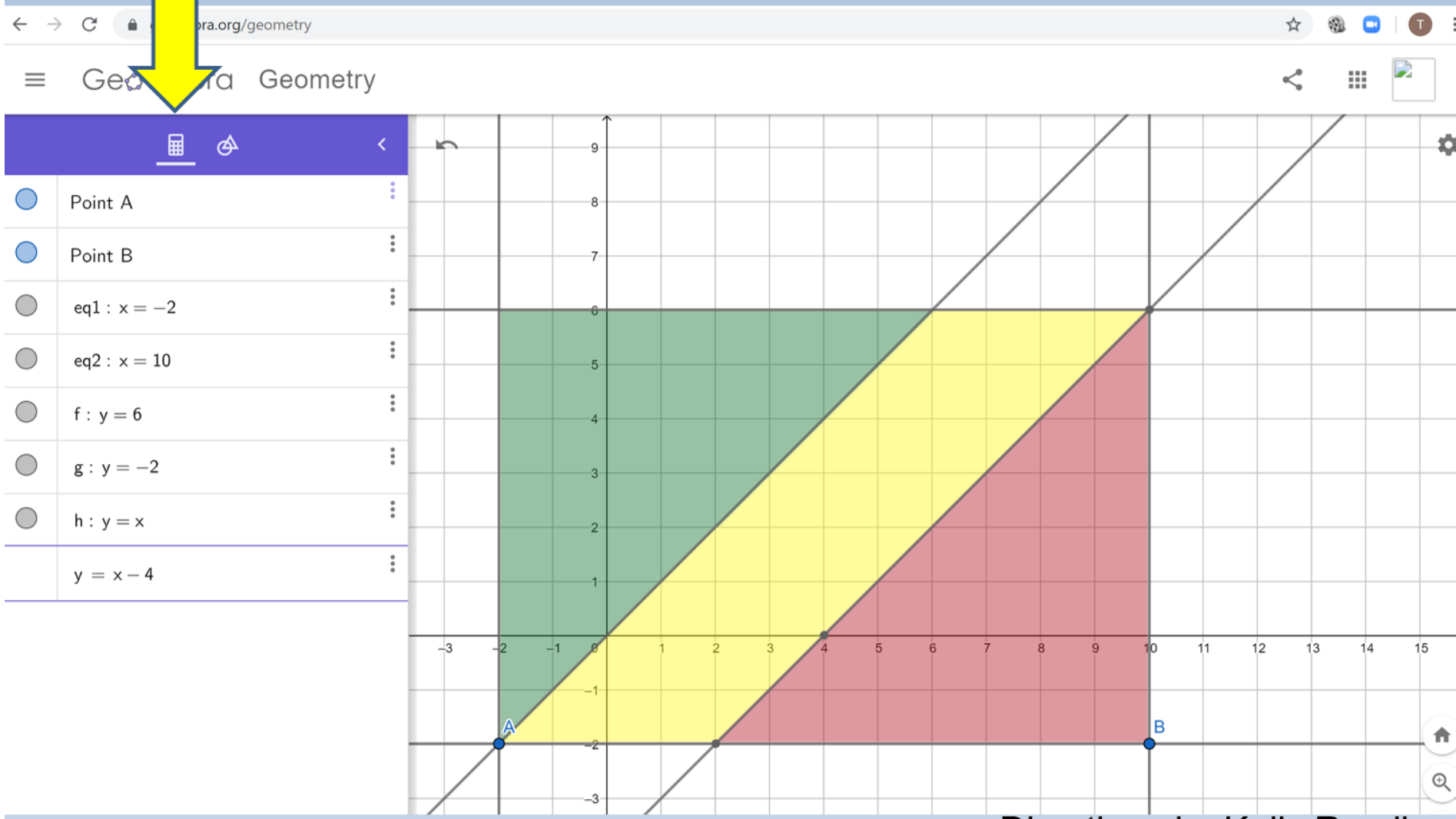
Click on the calculator & type the equations that model the flag



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QUESTIONS NOW?
Chat Box

IDEAS FOR LATER?
1. Have students work w/ other flags.
2. Have students explore:
* How can we rotate/reflect the flag?
* How can we graph shaded regions?

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ON TUESDAY (4/7/20), the recording of this webinar will be posted online at: https://www.imsa.edu/events/

Later, if needed, make a “Ask A Specialist” appointment: https://www.imsa.edu/educator-development/e-teaching-resources/

Friday Night Fun with Flags: GeoGebra for Geometry and Graphing Additional resources:

https://www.geogebra.org/

https://www.britannica.com/topic/flag-of-the-Republic-of-the-Congo

https://www.britannica.com/topic/flag-of-Brazil

https://www.britannica.com/topic/flag-of-Switzerland

https://www.britannica.com/topic/flag-of-Germany

Remijan, K.W. (Under Review). "Teaching Math with Flags: Geometry and Algebra Connections to Build Global Awareness"

Ask a Specialist

Get help from our Education experts!

The Illinois Mathematics and Science Academy (IMSA) Center for Teaching and Learning team is here to help teachers and parents with any questions from “how do I get my courses online quickly” to “how do I help with math problems”, to “where can I find resources for my student” to e-learning tools, and much more.

Schedule to reserve a live Zoom video appointment with any of our specialists: https://www.imsa.edu/educator-development/e-teaching-resources/

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THANK YOU FOR TRYING GEOGEBRA!!

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